Case Report

Press-through package mis-swallowing: Usefulness of computed tomography

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Case: An 88-year-old female with Alzheimer's-type dementia who mis-swallowed a press-through package visited our emergency department.

Outcome: Plain radiography detected no foreign bodies, whereas plain computed tomography showed an elliptical body with a high density in the lower esophagus. The press-through package containing a tablet in the esophagogastric junction was successfully removed without severe complications using the endoscopic protector hood. In cases of press-through package mis-swallowing, it is important for emergency physicians to make an early and correct diagnosis of the location of the package, which shows high radiolucency. Based on the results of this case, we hypothesize that carrying out early computed tomography examinations is useful for identifying swallowed press-through packages. Our retrospective investigation showed that computed tomography has a sensitivity of 100% for detecting press-through packages.

Conclusion: We experienced a case of press-through package mis-swallowing diagnosed on computed tomography. We recommend performing computed tomography examinations, especially in patients with an uncertain history and unclear symptoms.

Key words: Computed tomography, mis-swallowing, press-through package, radiolucency

INTRODUCTION

PRESS-THROUGH PACKAGES (PTPS), which consist of lids coated with a heat-sealed material on an aluminum leaf and a dome of vinylchloride, are widely used in Japan to enclose drugs due to their features of cleanliness, a hermetic seal, ease of handling, toughness, and low cost. However, the potential for elderly individuals and subjects with mental or visual disturbances to mis-swallow a PTP is a serious issue for emergency physicians. Swallowing a PTP with sharp corners carries a potential risk for gastrointestinal bleeding, mediastinitis, intestinal perforation, and obstructive ileus, although such severe complications are extremely rare.[1–3] Endoscopic removal should be carried out in cases involving PTPs in the esophagus or stomach, and early laparotomy should be considered if the material passes through the pyloric ring, causing symptoms.[4] Therefore, it is very important to make an early and correct diagnosis of the location of the PTP. However, PTP material is difficult to detect directly on plain radiography due to its high radiolucency, and the timing and validity of computed tomography (CT) examinations have not been established. Previous reports have shown that, in most cases, the correct diagnosis is not made until the use of endoscopic examinations or surgery.[1–3] We herein report a case of PTP mis-swallowing diagnosed on CT and briefly discuss the usefulness of carrying out early CT examinations for identifying swallowed PTPs.

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CASE REPORT

AN 88-YEAR-OLD WOMAN with Alzheimer's-type dementia visited the Emergency Department of the University of Occupational and Environmental Health Hospital (Kitakyushu, Japan) complaining of slight throat pain and discomfort. The patient told her family that she had mis-swallowed a single-tablet allotment containing a tablet; however, during the hospital visit, she did not remember the

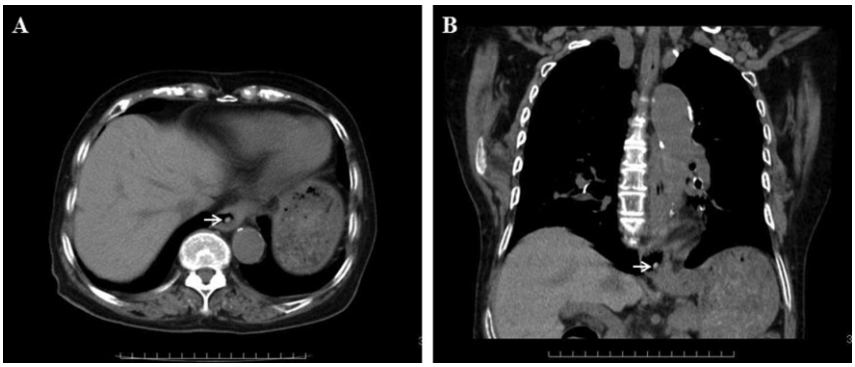

Fig. 1. Axial (A) and coronal (B) plain computed tomography images showing an elliptical body with a high density in the lower esophagus (arrow).

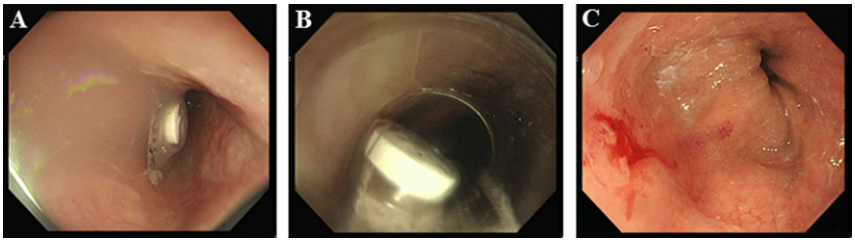

Fig. 2. Endoscopic images showing a press-through package (PTP) containing a tablet in the esophagogastric junction (A), the method of PTP removal using an endoscopic protector hood (B), and the minimal amount of bleeding in the lower esophagus following extraction of the PTP (C).

event. The patient took six medications and managed the single-tablet allotments by cutting up the sheets of the PTP. Her vital signs were clinically stable, and a physical examination revealed normal respiratory sounds, a soft abdomen without tenderness, and normal bowel sounds. Routine laboratory examinations indicated no particular findings, except for elevation of plasma glucose (186 mg/dL). Plain chest and abdominal radiography detected no foreign bodies, whereas plain 32-slice CT (Aquilion 32; Toshiba Medical Systems Co., Tokyo, Japan) showed an elliptical body with a high density (7 mm length on the major axis), suggesting the presence of a tablet, in the lower esophagus (Fig. 1). After the CT examination, we were unable to identify the foreign body on a retrospective review of the radiography images. Following the i.v. injection of 5 mg diazepam for sedation, an emergent endoscopic examination of the upper gastrointestinal tract was carried out using a conventional video endoscope (Olympus Optical Co. Ltd., Tokyo, Japan). The endoscopic images showed the presence of a single-tablet allotment of a PTP containing a tablet in the esophagogastric junction, that is, the third physiological area of narrowing of the esophagus (Fig. 2A). The PTP was successfully removed by pulling it into the endoscopic protector hood using forceps (Fig. 2B). The size of the square PTP was approximately 13×15 mm. Although the endoscopic images obtained immediately after extraction showed minimal bleeding of the esophageal mucosa due to the sharp edges of the PTP (Fig. 2C), the patient was judged to not have an indication for endoscopic banding. Her throat pain and discomfort improved, and no further symptoms developed. She was discharged to home without prophylactic antibiotic therapy.

DISCUSSION

ELDERLY PATIENTS, AS in the present case, often visit the emergency department for various reasons, including the rapid aging of the Japanese society, the associated proportion of the population with dementia, the increased number of drugs dispensed in PTPs, and a lack of attention. Swallowing a PTP is associated with an increased risk of serious complications depending on the duration from onset. Therefore, making an early and correct diagnosis of the location is necessary when cases of PTP mis-swallowing are encountered in the emergency department. However, it is difficult to detect PTPs on plain radiography due to their high radiolucency. Additionally, although CT is more sensitive than plain radiography in detecting PTPs, the appropriate timing and validity of this method have not been established. A previous study showing the high diagnostic value of CT for detecting foreign body ingestion concluded that CT is useful in cases in which endoscopy shows negative findings but the patient continues to exhibit persistent symptoms.[5]

Based on the results of this case, we hypothesize that carrying out early CT examinations is useful for identifying

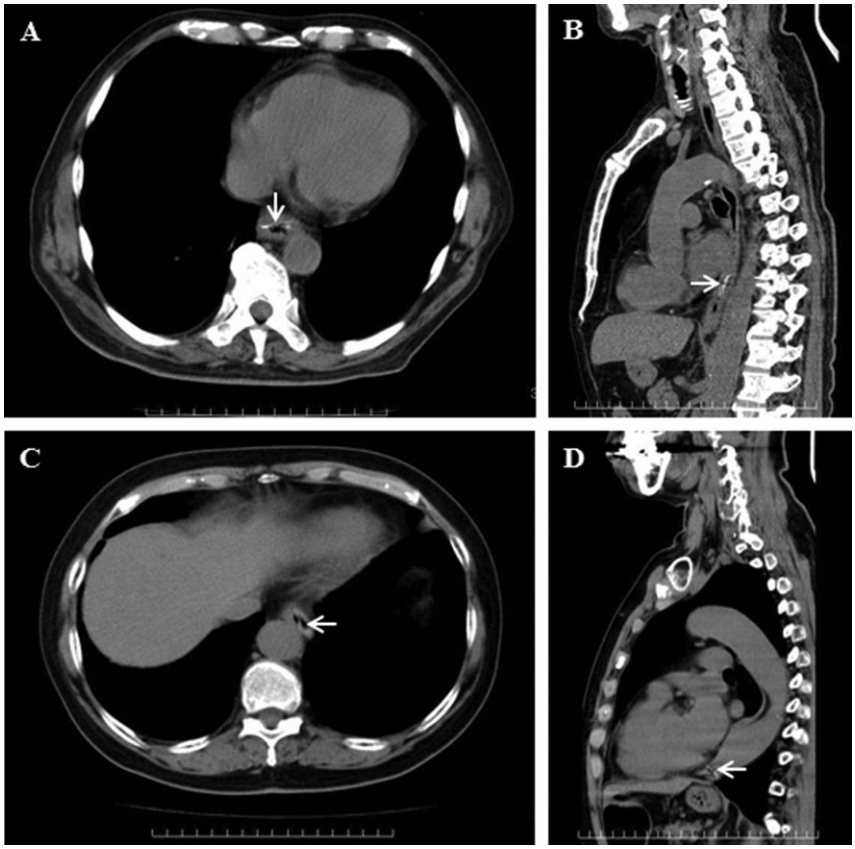

Fig. 3. Axial and sagittal computed tomography images showing a linear body with a high density (A, B) and abnormal area of trapped air (C, D) (arrow).

swallowed PTPs. In order to test this hypothesis, we retrospectively investigated a total of 17 patients (3 men and 14 women, 61–94 years of age, 3 with dementia) who swallowed PTPs located in the esophagus that were endoscopically removed in the Endoscopy Unit of our hospital after January 2010. Endoscopy was carried out in four patients (23.5%) and nasal fiberscope in seven patients (41.2%) were performed immediately after visiting our hospital. Although the number of subjects is very low, radiography and CT were found to have a sensitivity of 0% (0/4) and 100% (10/10), respectively. This finding indicates that CT should be considered as the initial approach to make an early and correct diagnosis of the location. In order to avoid unnecessarily invasive procedures, CT should be used to examine patients with an uncertain history and unclear symptoms. However, careful consideration should be given to cases involving mis-swallowing of PTPs without a tablet, as such materials have potential difficulties in being detected on CT. In 5 of 8 cases of mis-swallowing of PTPs containing a tablet, CT detected only the tablet. Figure 3 shows the CT images in two representative cases of mis-swallowing of PTPs not containing a tablet. The PTP was visualized as a linear body with a high density in the first case (Fig. 3A, B) and as an abnormal area of trapped air in the second case (Fig. 3C, D). The latter case suggests that PTPs may not be detected if air is not trapped within the material.

We propose that the radiolucency of the PTP material should be decreased in order to make the product definitively detectable, at least on CT, and suggest that the diagnostic accuracy of CT for detecting swallowed PTPs increases when using the combination of axial, coronal, and sagittal images.

CONCLUSION

WE EXPERIENCED A case of PTP mis-swallowing diagnosed on CT. From this case report, CT examination should be considered as the approach for initial diagnosis in cases of PTP mis-swallowing.

CONFLICT OF INTEREST

NONE.

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